

ABSTRACT

Embodiments include semiconductor devices and a methods for manufacturing the same that suppress deficiencies in the transistor characteristics. A method for manufacturing a semiconductor device includes the steps of (A) forming a polishing stopper layer 14 having a predetermined pattern over a substrate 10, (B) removing a part of the substrate using the polishing stopper layer 14 as a mask to form a trench 16, (C) forming a trench oxide film 18 over a surface of the substrate 10 that forms the trench 16, (D) forming an insulating layer 21 that fills the trench 16 over an entire surface of the substrate, (E) polishing the insulating layer 21 by a chemical-mechanical polishing, (F) removing the polishing stopper layer 14, and (G) etching a part of the insulating layer 21 to form a trench insulating layer 20. The method further includes the step (a) of forming an etching stopper layer 90 for the trench oxide film 18 over the trench oxide film 18 at least above the trench 16, and the etching stopper layer 90 is more resistant to etching than the insulating layer 21 in the step (G).

15